Evolution of Logging

An overview of the evolutionary development of the logging industry in the Continental US

Regional Development

- Begun in Northeast
  - Early 1700s
  - Mostly local building but, also increased hardwoods demand for furniture industry
- Southeast Followed Shortly
  - Mid to late 1700s
- Midwestern Development Followed Westward Migration
  - Circa 1780s
- West Coast Came with Gold Rush
  - About 1850

Change Drivers

- Demand
  - Local vs Distant Market
- Advances in Technology
  - Circular Saw, Band Saw
  - Steam Donkey
  - Geared Locomotive
  - Chain Saw
- Terrain
  - Mountains, Hills, Plains, Swamps
- Type and size of tree

Northeastern Operations

- Water Power
  - Oscillating saw
  - Circular saw
  - Band saw late
- Favorable waterways
  - Accumulate logs at stream landing
  - River log drive to mill pond
- Primary harvests in Fall & Winter

Northeastern Operations – Cont.

- Locale – Maine, New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Maryland, Virginia, West Virginia
- Flat to rolling coastal and river valley
- Appalachian Mountain Terrain
- Generally mixed evergreen and deciduous
- Log diameters generally four feet or less
- First area to be logged
- Mostly smaller operators

Tools and Methods

- Primary woods tools
  - Double bitted axe
  - One or two man crosscut
  - Oxen, Mules and Horses
  - Steam donkey engine from 1860s
- Sawmill
  - Generally small, some even portable
  - Earliest used water power
  - Relatively low production rate
- Railroads mid ’80s

Splash Dam

A Log Jam

Oxen Skidding Logs

Oxen Skidding Logs

East Coast Prime

- Williamsport, PA
  - lumber capital of the world in 1850.
  - Mills produced 250 MMbf lumber per year.
  - 30 Mbf/day was the norm for kindling for New York City markets.
  - Best production for a shift was set in New Hampshire around 1910. Over 100 Mbf in a shift (12 hrs).

Moving Logs to Landing

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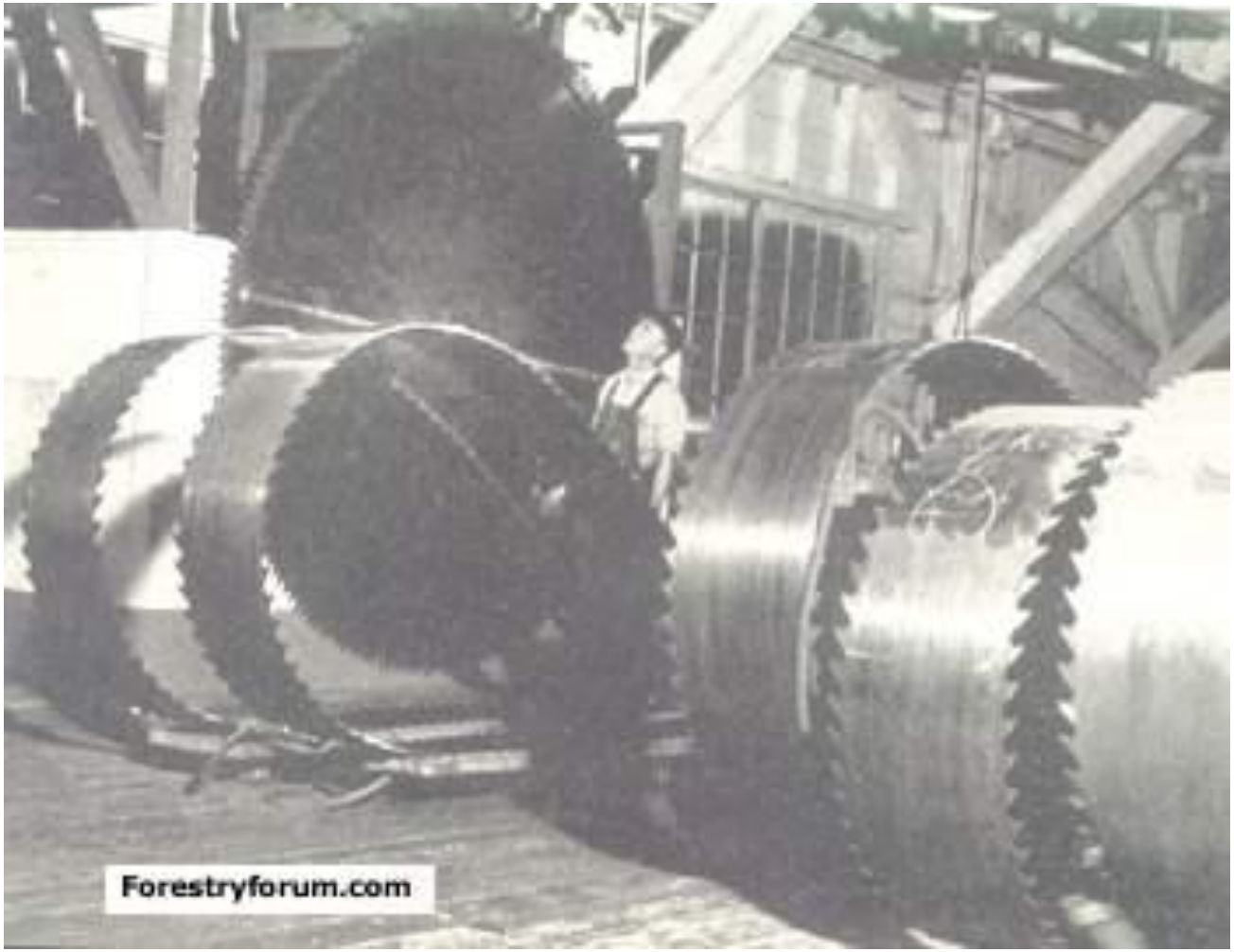
Moving Logs to Landing

Twin Circular Mill

Band Saw Blades



Caulked Boots

Southern Operations

- Water Powered Evolving to Steam
  - Oscillating saw
  - Circular saw
  - Band saw late
- Favorable waterways
  - Accumulate logs at stream landing
  - River log drive to mill pond
- More benign terrain but, swamp land
- Year around harvests

Southern Operations – Cont.

- Locale – Carolinas, Georgia, Florida, Alabama, Missippi, Louisiana, Texas
- Mostly mixed but large forests of Southern Yellow Pine
- Cypress in bogs and swamps
- Log diameters to four feet or so
- Logging industry later than NE
- Many smaller operations

Tools and Methods

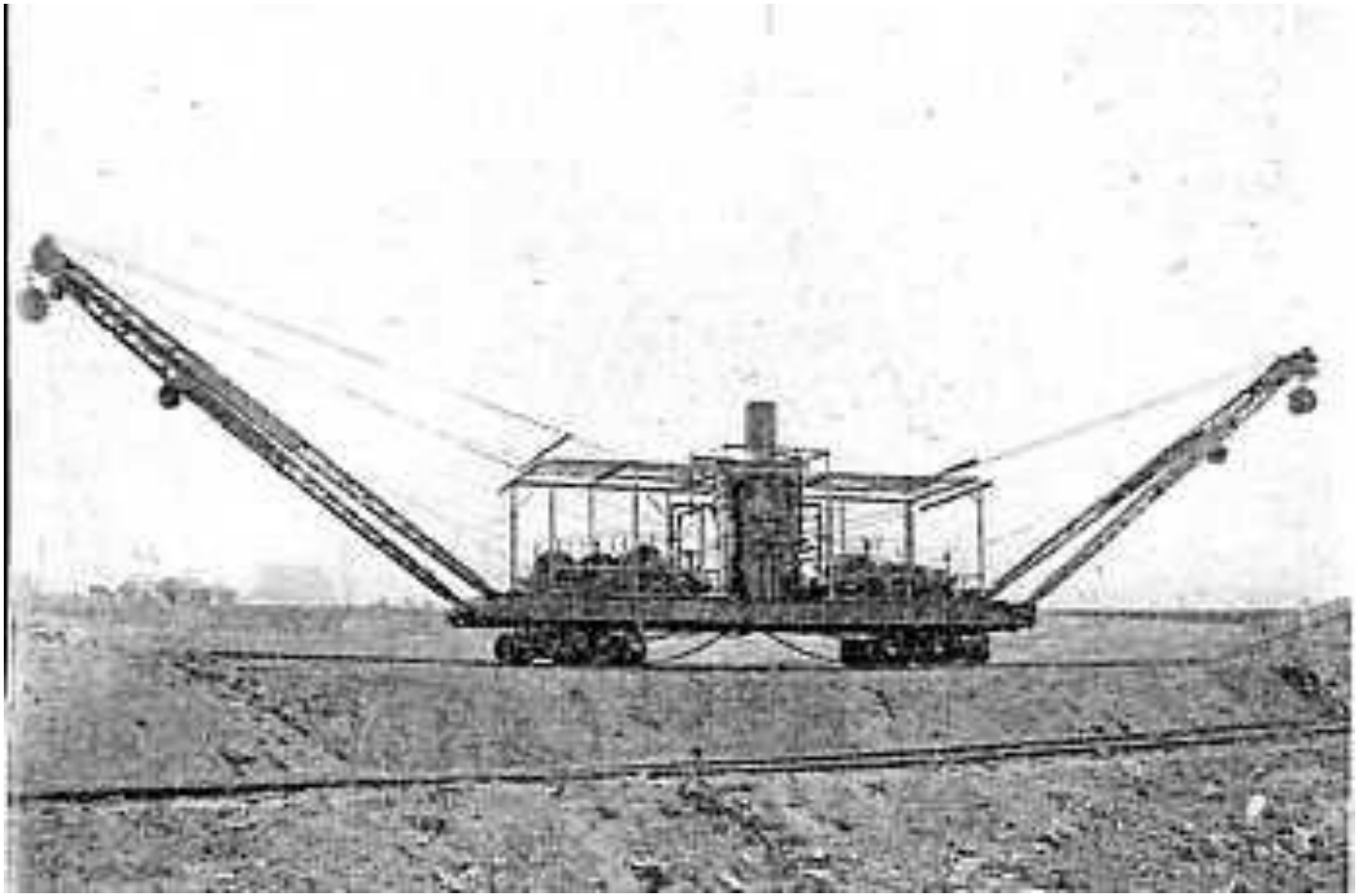
- Primary woods tools
  - Double bitted axe
  - One or two man crosscut
  - Oxen, Mules and Horses
  - Steam donkey engine from 1860s
- Sawmill
  - Generally small, some even portable
  - Earliest used water power
  - Evolving to steam by 1880s
- Railroads mid ’80s

Logging Cyprus

Early Logging in Georgia

Ed Jackson

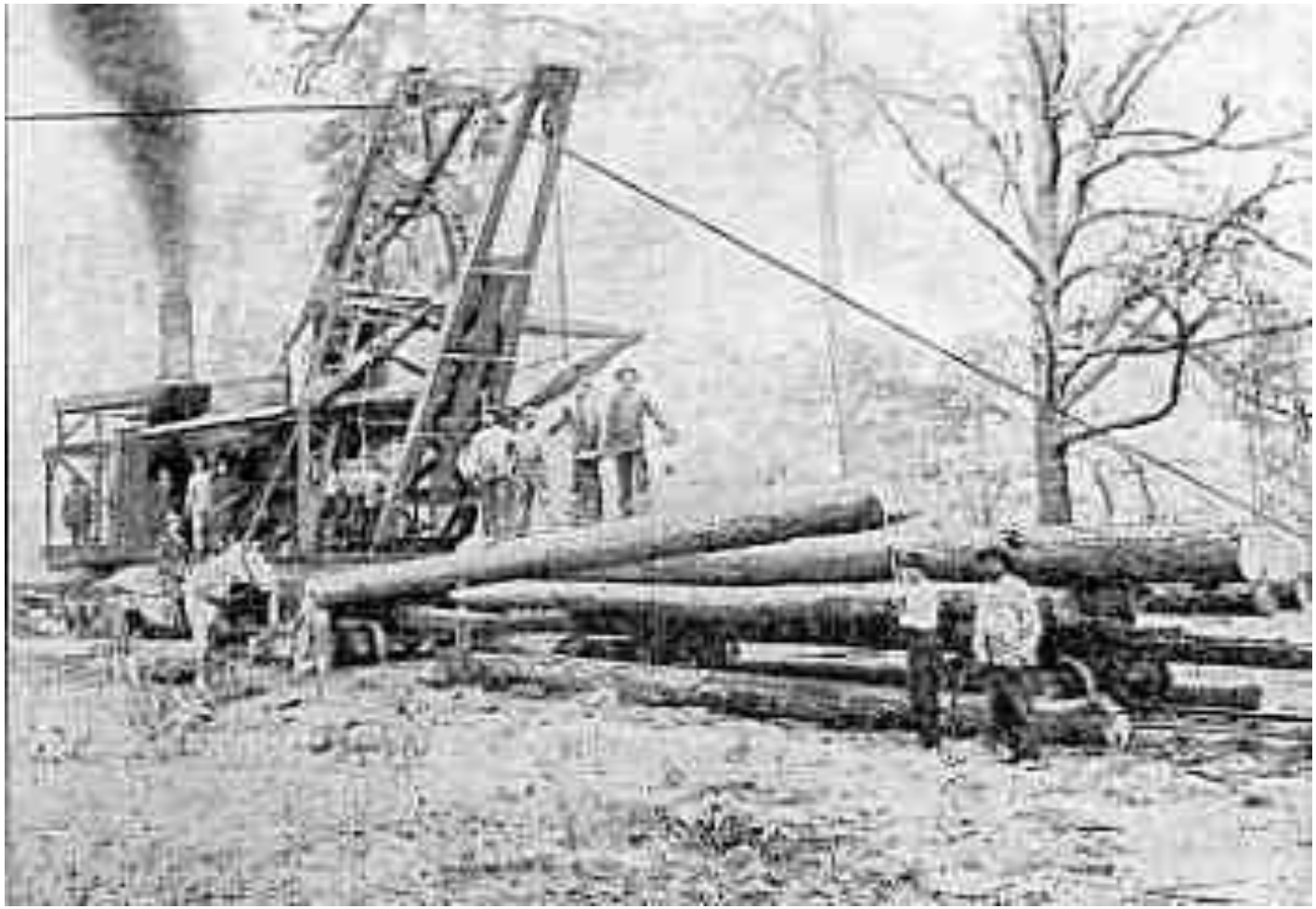
Clyde Skidder



Log Skidder-Loader

- Clyde combination two line skidder and loader
  - loader with steel swinging boom
  - Frame provided for spotting cars through the machine over the trucks.
  - Three engines; two for the skidding lines (each engine having two drums, one for an outhaul line and one for the skidding line)
  - Third engine for loading, two drums, one for loading line and the other for a spotting line
- With independent skidder and loader
  - Using skidder to best advantage, it was possible to keep the loader and both crews busy constantly
- Disadvantage of combined skidder loader
  - All production stopped by an accident at either end of the operation.

Russell Skidder in South

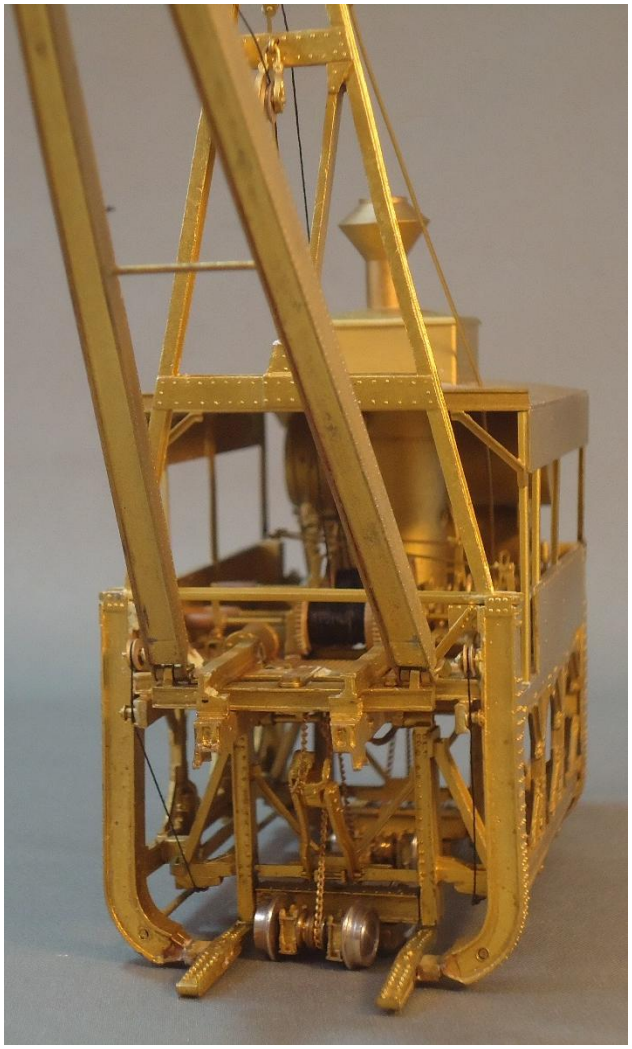


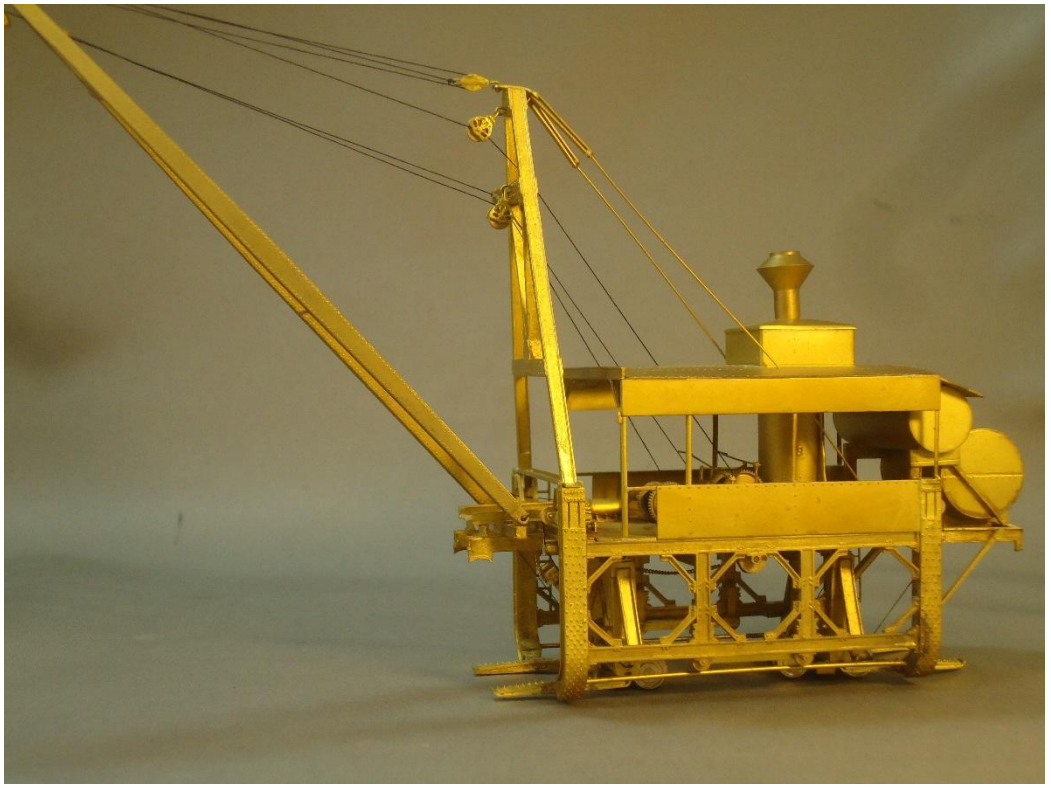
The Russell Skidder

- Skidding done with heavy-duty logging engine
  - Cylinders 9 inches by 11 inches, boiler pressure 150 psi
  - Three skidding drums 30 inches in diameter, 30 inch face, two in constant use
  - Also two drums for tightening guy lines, and drum for car spotting
  - On the front end of the machine is a skeleton steel tower from which is suspended a vertically hinged jib or triangle, from which the skidding sheaves are hung at the outer end. On each side of the jib just over the skidding sheaves is a guy line sheave. The two guy line sheaves are made fast one on each side of the machine, to any convenient stump or tree. The guy lines lead through the sheaves on the end of the hinged jib, through sheaves on the tower to two friction driven power operated drums on the skidding engine.

Barnhart Loader

McGiffert Loader

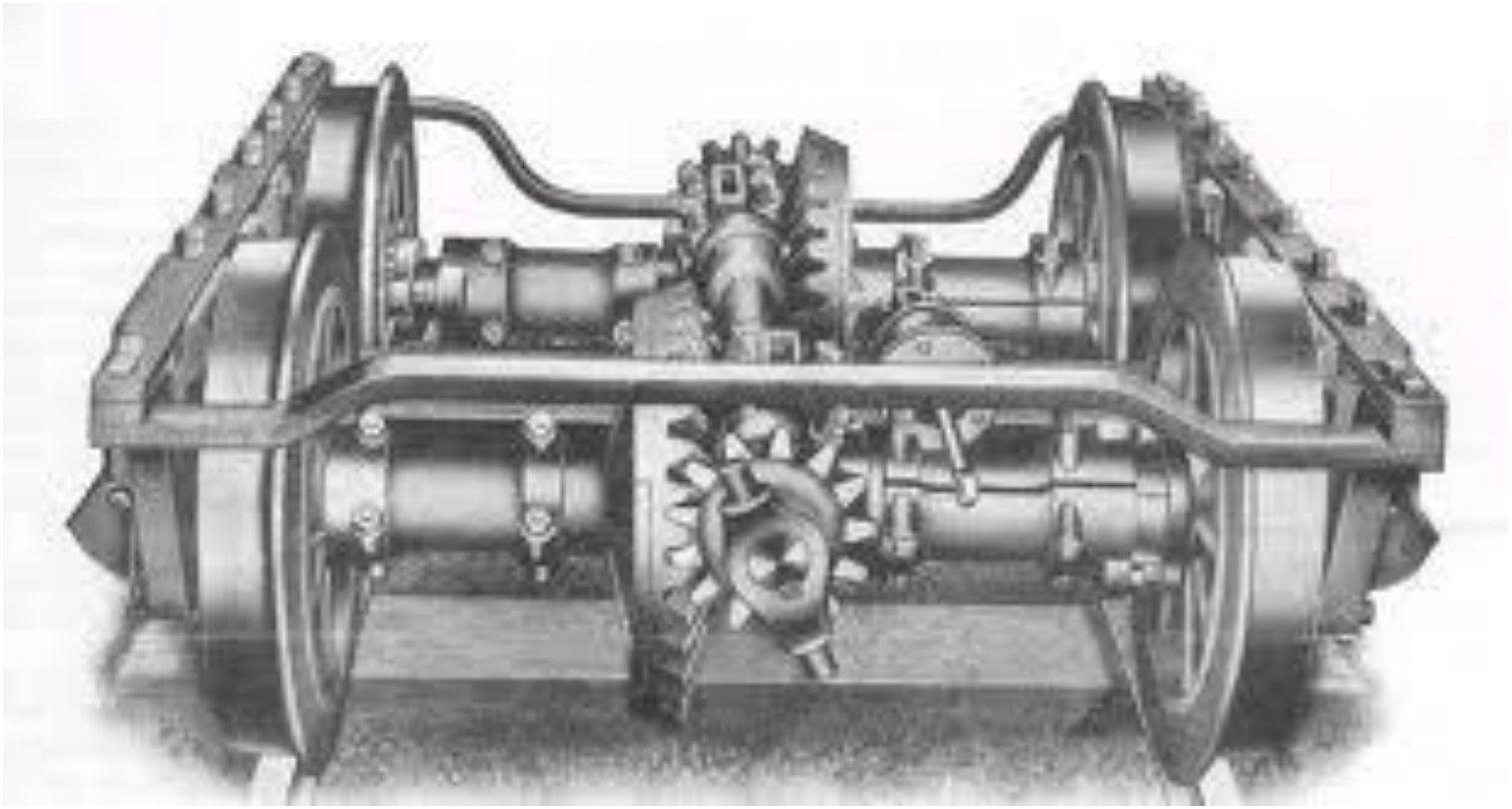




A Climax Locomotive

Three Truck Climax

Climax Truck



Midwestern Operations

- Mostly Steam Powered
  - Circular saw
  - Band saw later
- Favorable winter snow and ice
  - Accumulate logs at roadside landing
  - Sled haul to mill pond
- Very benign terrain, but lower tree density
- Late fall and winter tree harvests

Contributing Factors

- Locale – Michigan, Wisconsin, Minnesota: to a lesser extent Iowa, Illinois, Indiana, Ohio
- Terrain generally quite benign, no mountains
- Much mixed evergreen and deciduous but large stands of Northern White Pine
- Logs to 4 feet in diameter
- Many logging operators moved from East coast
- Some large operations

Tools and Methods

- Woods primary tools
  - Double bitted axe
  - One or two man crosscut
  - Oxen, Mules and Horses
  - Steam donkey engine from 1860s
  - Railroads by 1880s – mostly rod engines
- Sawmill
  - Generally moderate to small, some even portable
  - Most steam powered with a few using electricity by 1900

Michigan Logging

Sled Load in Midwest

The Record Ski Load

- The 1899 Columbian Exposition, or World's Fair, was held in Chicago to commemorate the 400th anniversary of the discovery of America.

  The World's Fair load of logs was hauled by the estate of Thomas Nester to the Ontonagon River on February 26, 1899. Hauled on bunks 16 feet long, nine flat cars were required to convey the logs to Chicago. This world record load of logs was part of the State of Michigan's exhibition. It was, and still is, the largest load of logs ever pulled by one span of horses.

  The load consisted of fifty 18 foot-long white pine logs on a sleigh scaling 36,055 feet and weighed 140 tons. The sleigh was made of bird's eye maple with heavily ironed runners. The load was 18 feet long, 18 feet wide, and 33 feet 3 inches high. It was pulled by a team weighing about 3500 pounds.

Ponsford Minnesota

Steam in Michigan

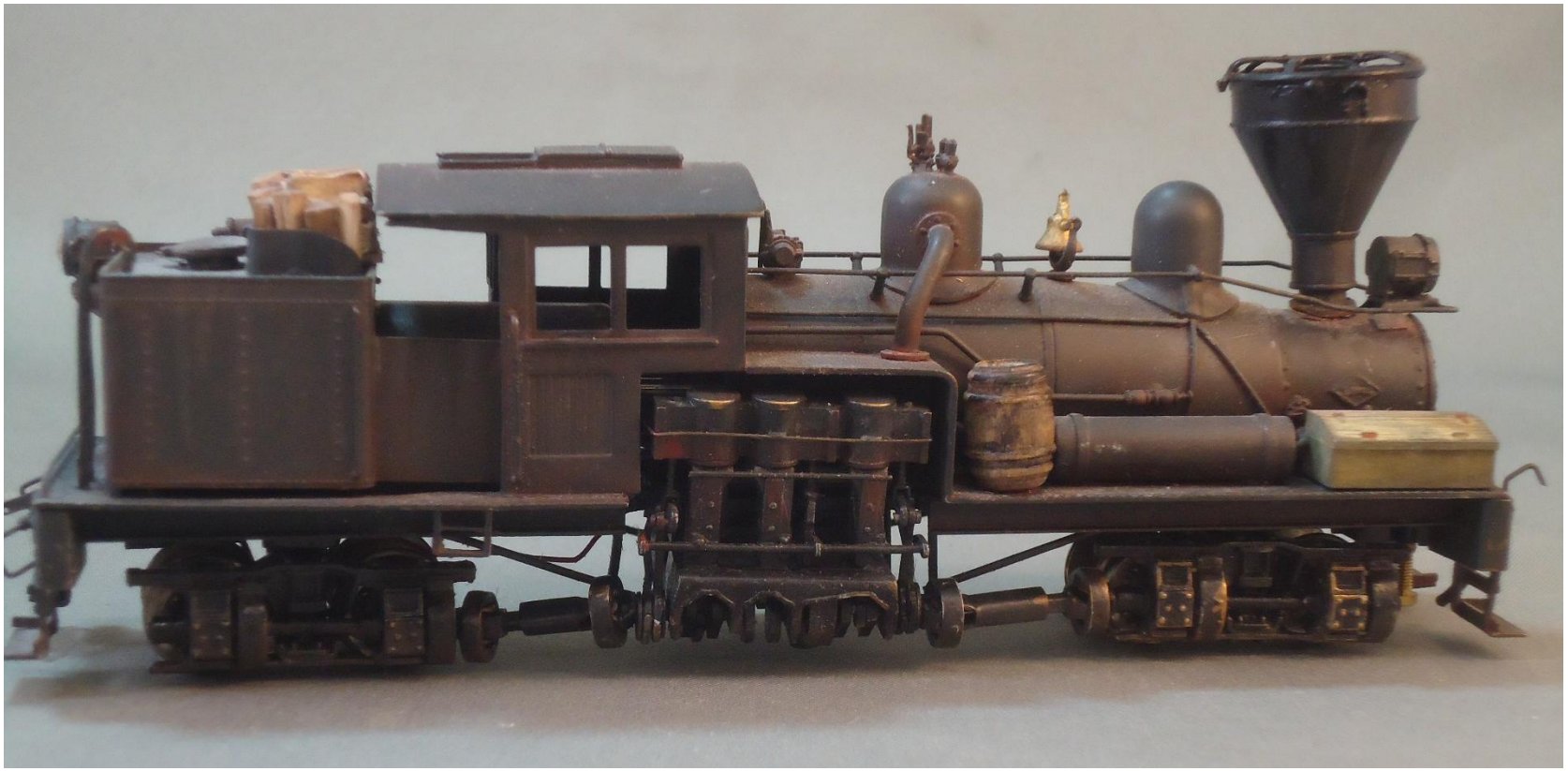
Michigan No. 1 Lumber

- **Lumber Was King In Michigan**

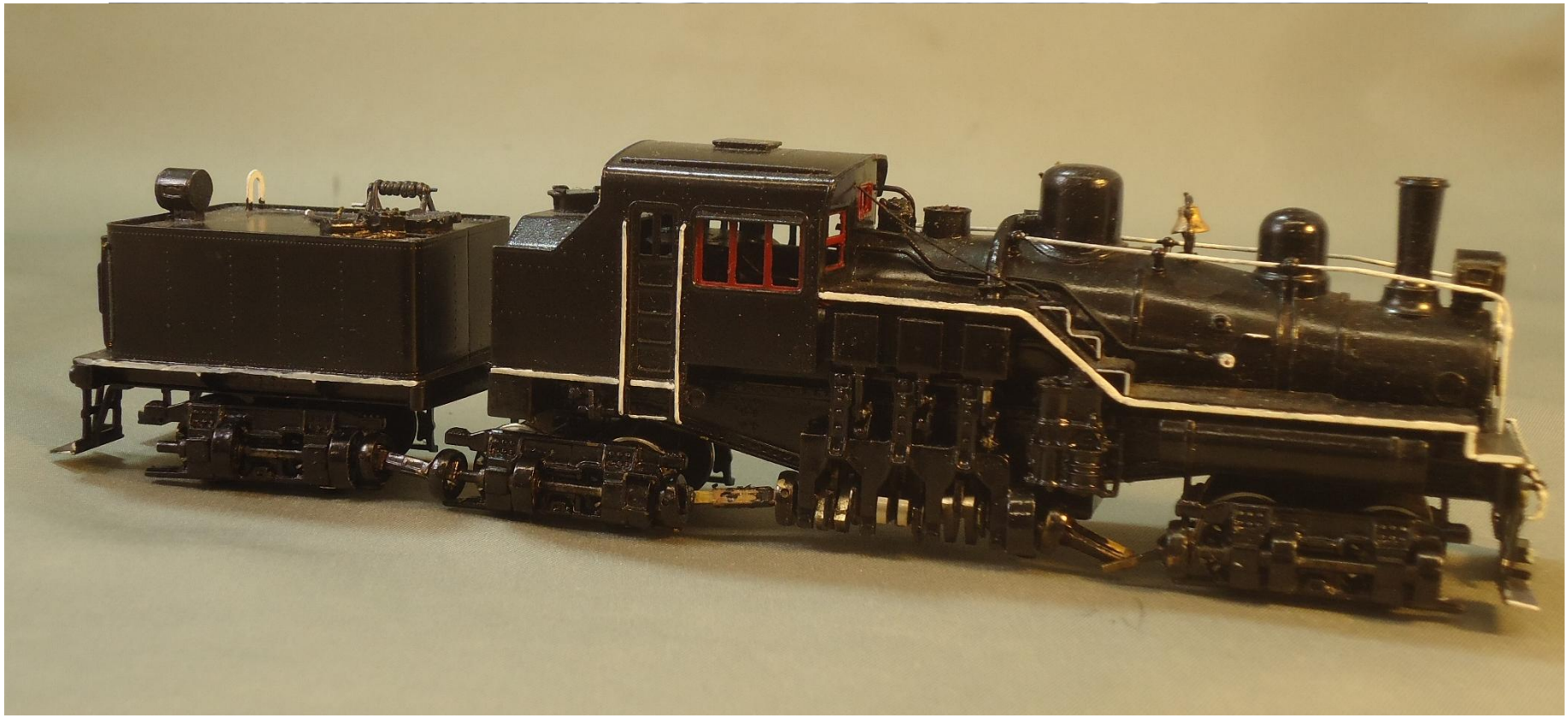
  In 1837, 435 sawmills active in Michigan. By 1873, when lumbering activity in Wexford County (Cadillac, MI area) was just getting started, there were more than 1600 sawmills in the state.

  Michigan ranked number one in lumber production in the late 1800's, with 1890 being the peak year, producing 4,250 billion board feet. By 1899, much of the pine had been harvested and Michigan slipped in ranks to number two. By 1911, Michigan had dropped to number 10. By the early 1930s the timbering was all but over.

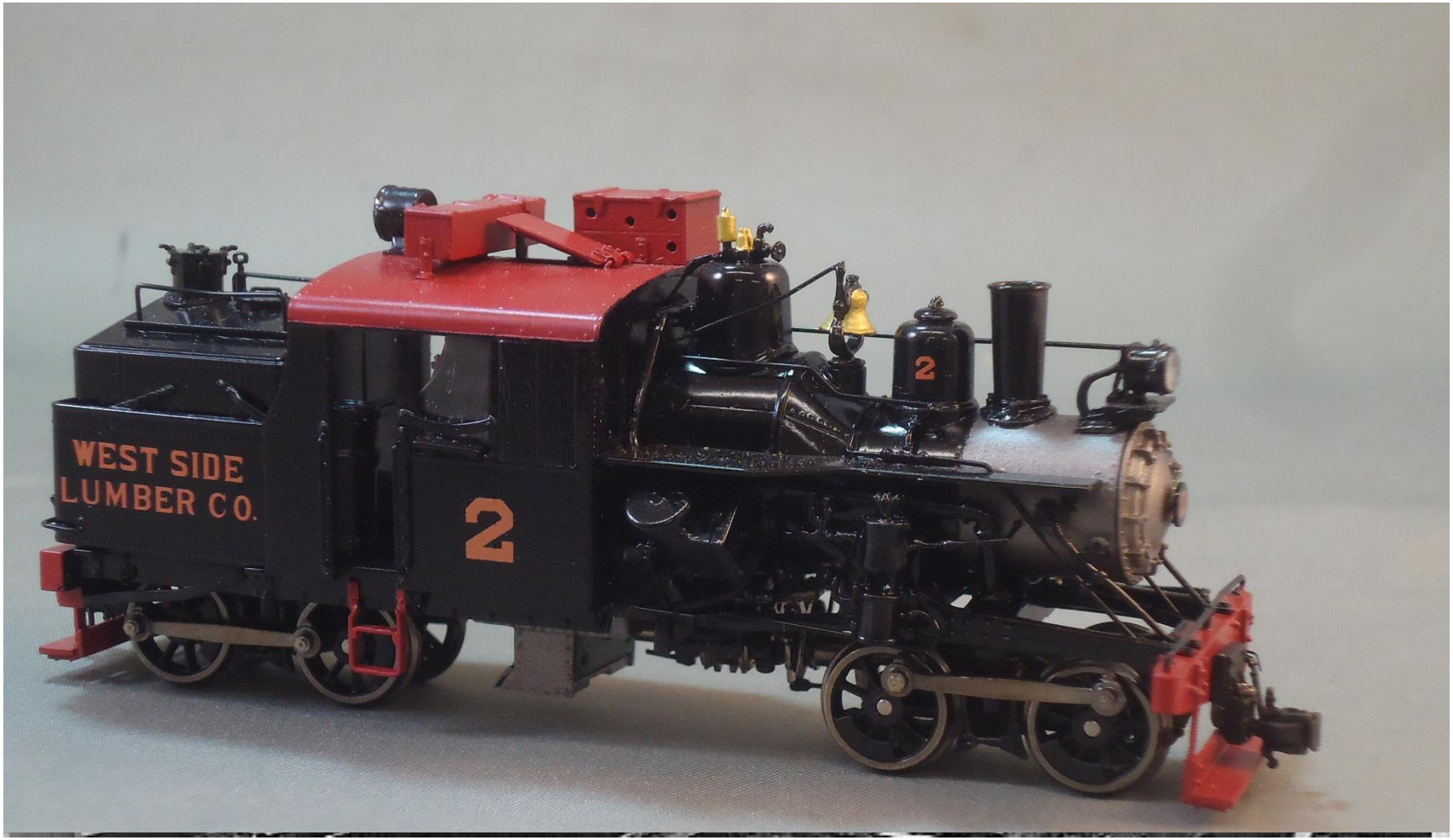
Shay Locomotive



3 Truck Shay Locomotive



The Heisler



West Coast Operations

- Mostly Steam Powered
  - Circular saw –small outfits
  - Band saw – big companies
- Lack of good waterways
  - Had to bring railroad and accumulate logs at railside landing
  - Very large old growth logs
- Very unfriendly mountain terrain, steep slopes, deep valleys, but high tree density
- Some year around, Some Spring, Summer and Fall

West Coast Operations – Cont.

- Locale – California, Oregon, Washington, to lesser extent, Idaho, Wyoming, Montana, Colorado
- Large stands of Fir, Spruce, Pine, Red Cedar
- No commercially exploitable hardwoods
- Logs to 12 feet or more diameter
- Many logging operators moved from Midwest
- Many large operations – Double band mills 100M board feet /day
- Wide use of mechanical power

Tools and Methods

- Woods primary tools
  - Double bitted axe
  - One or two man crosscut
  - Oxen, Mules and Horses
  - Steam donkey engine from 1860s
  - Railroads by 1880s – mostly geared engines
- Sawmill
  - Generally moderate to large, a few portable
  - Most steam powered from the start with a few using electricity by 1900

Focus on West Coast

- Log skidding
  - Initially Oxen, Mules, or Horses
  - Next step – the Dolbeer donkey engine
    - Skid road
    - Whistle punk
  - Then came the yarder
    - Multi-spool donkey
    - Tower Skidder

The Springboard

The Dolbeer

The Undercut

Big Log!

Mountain Slope

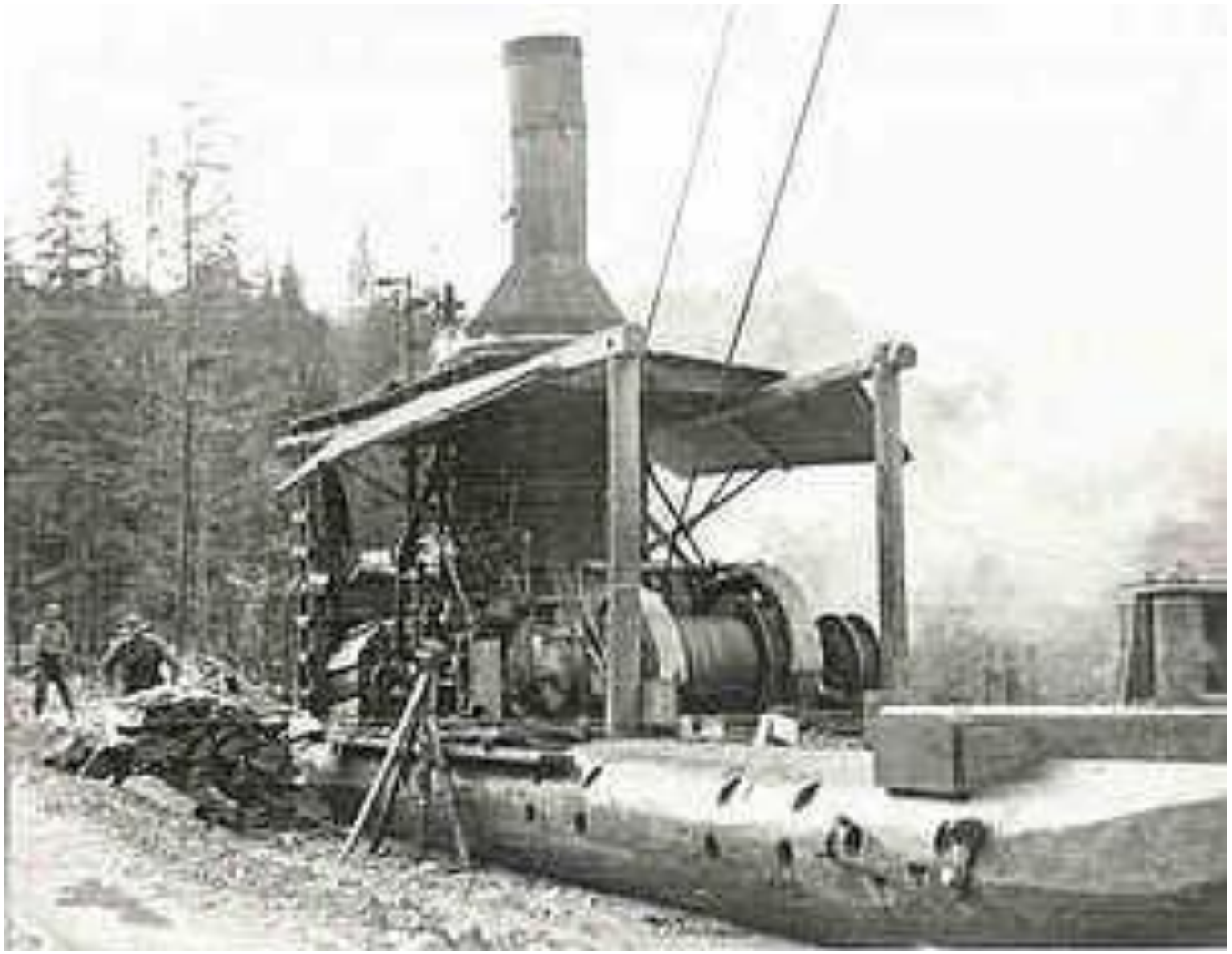
Heisler Locomotive & Log Train

Skyline Rigged Spar Tree

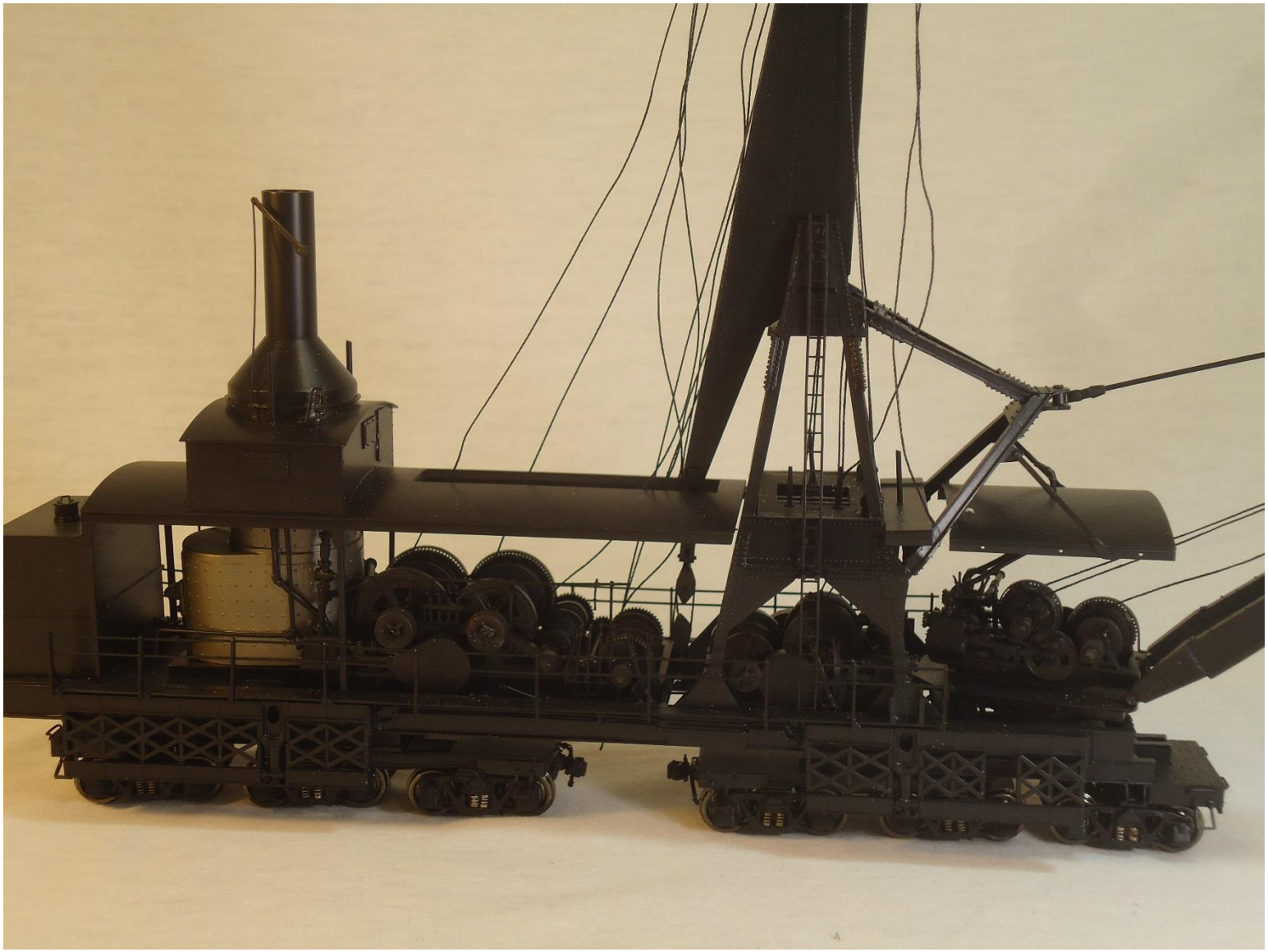
Skyline Logging Panorama

Yarding with Spar Tree

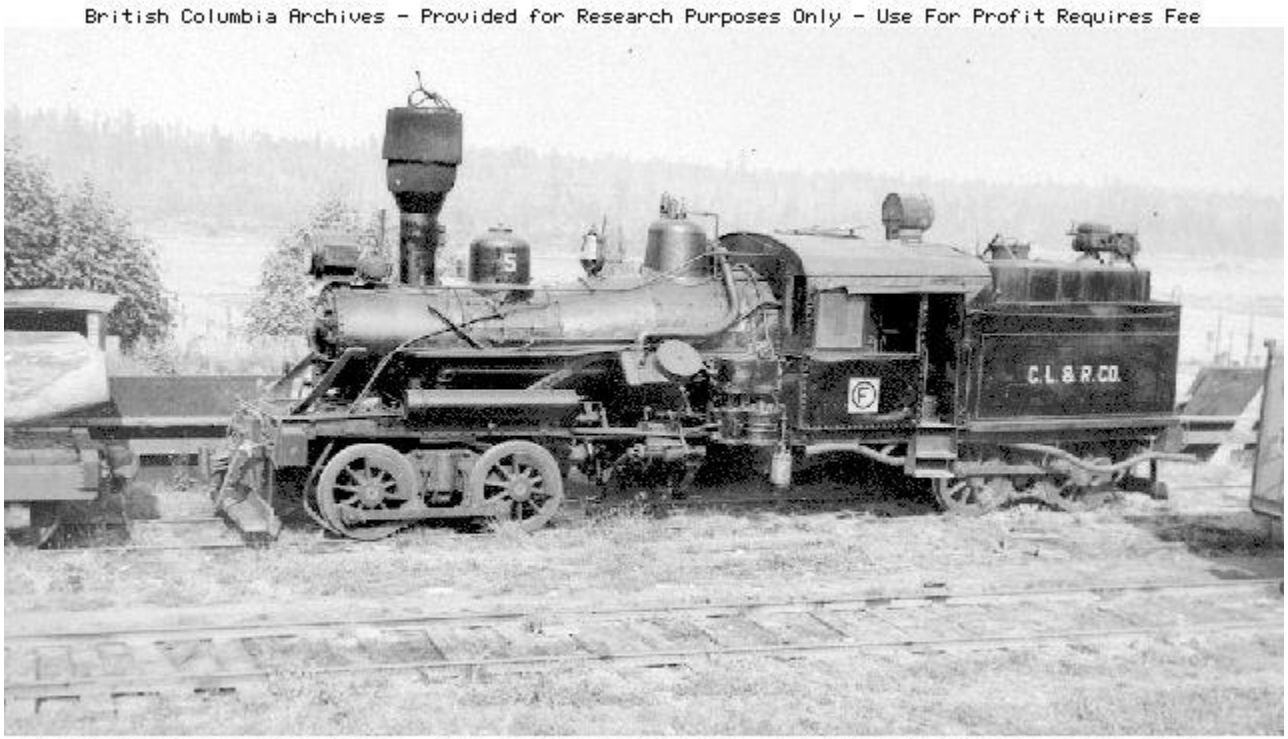
Large Steam Donkey



Lidgerwood Tower Skidder



Heisler Locomotive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access@www.bcarchives.gov.bc.ca Call #: C-05996 Comox Logging & Railway Heisler Engine No. 11 At ...

Horses with Big Logs

Typical Locomotive Choices

- Shay – built by Lima
- Climax – built by Climax Locomotive Co.
- Heisler – built by Heisler Locomotive Works
- Willamette – built by Willamette Iron and Steel Co.
- Why these?
- Guages?

Other Mechanical Aids

- Donkey engines
- Loaders
  - Hayrack or Heel Boom
  - Barnhart
  - McGiffert
  - Clancy
- Skidders and Yarders
  - Clyde
  - Lidgerwood
  - Russell
  - Willamette

Rolling Stock

- Flat cars
- Skeleton log cars
- Disconnects
- Misc support
  - Box cars
  - Tank cars
  - Cabooses
  - Gondolas
  - Reefers

Passenger Operations

- Some chartered as common carriers
  - Right of eminent domain
  - Weyerhauser